Brief Report DOI: 10.22114/ajem.v4i2s.425

A Limited Self-Claimed Web-Based Survey COVID-19 Contamination among Iranian Healthcare Workers

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Published online: 2020-05-11

Abstract

Introduction: It is likely that high rate of healthcare workers (HCWs) infection has occurred in Iran, but there is not any proof yet.

Objective: This study was conducted to highlight the rate of Iranian HCWs infected by COVID-19 and some of its surrounding points.

Methods: This cross-sectional study was conducted in Tehran, Iran. Using web-based applications including WhatsApp, Telegram, Instagram and Facebook, the link to the questionnaire was sent and exposed to the eligible ones. The target population of the study was HCWs who were diagnosed as approved cases of COVID-19. They were asked about their baseline characteristics and also possible source of infection, symptoms onset, hospitalization and etc. All findings presented by frequency and percent.

Results: From March 29, 2020 to April 5, 2020, a total of 452 HCWs had completed the online questionnaire of whom 50.9% were women; mostly were in the age range of 25-29 years old. Among the participants, physicians had the largest population with 312 people (69.0%). The most frequent clinical symptoms were fatigue, fever and myalgia, respectively. The highest frequency with 85 cases (18.8%) was reported their symptoms onset within 20-24th February, 2020. The most commonly used piece of equipment was gloves, which was used in 57.3% of the cases, followed by simple surgical mask, which was used by 47.1% of the participants. In 21.9% cases no personal protective equipment was used. Totally, 348 cases (91.6%) were treated in an outpatient setting and only 36 cases (9.5%) needed to be hospitalized. In 160 cases (35.4%), at least one other person was infected with COVID-19 in their household.

Conclusions: Considerable number of participants that declared their infection in this study, emphasizes on the considerable rate of Iranian HCWs infected by COVID-19.

Key words: COVID-19; Health Personnel; Iran; Pandemics; Self Report

Cite this article as: Farahmand S, Bagheri-Hariri S. A Limited Self-Claimed Web-Based Survey COVID-19 Contamination among Iranian Healthcare Workers. Adv J Emerg Med. 2020;4(2s):e54.

INTRODUCTION

In late 2019, acute respiratory syndrome broke out in Wuhan, China, due to a novel coronavirus, formerly known as nCoV-2019 and later called Severe Acute Respiratory Syndrome coronavirus 2; (SARS-CoV-2). In February 2020, the World Health Organization (WHO) confirmed COVID-19 as a disease caused by Coronavirus 2019 [1]. Since February 19, 2020, with the official confirmation of Iran's Ministry of Health and Medical Education, the onset of coronavirus outbreak as COVID-19 in the country was announced and on February 20, 2020, the Corona Taskforce was established in Iran and took charge of preparing, mobilizing and managing resources to confront the new outbreak. According to the latest data, Iran is among the 10 countries with the highest epidemic rates [2]. Health care workers (HCWs) are in close contact with many COVID-19 patients and consequently with SARS-CoV-2 virus in their workplace; therefore, a cautious approach should be considered to monitor them, and identify their initial complaints and symptoms and so on. These measures may prevent the transmission of the disease from these individuals to other patients, staff and their families. In China, an estimated 3000 HCWs have been infected with the coronavirus, with 22 reported deaths [3]. It is likely that high rate of HCWs infection has occurred in Iran, but there is not any proof yet. This study was conducted to highlight the rate of Iranian HCWs infected by COVID-19 and some of its surrounding points.

Methods

This cross-sectional study was conducted in Tehran, Iran. A questionnaire (Available via URL: https://docs.google.com/forms/d/1yaYIeTO-Teeb

HLDKMU-xONBaUAD1FrsxWEMyDE-tt0/edit) was used to gather required information. The questionnaire was generated by two faculty members of the emergency medicine department, Tehran University of Medical Sciences (TUMS). Then, with the expert opinion of other faculty members, including emergency medicine and infectious disease specialists, face validity and content validity of the questionnaire was approved in Farsi. Then the questionnaire was sent to 10 selected staff and personnel at Imam Khomeini Hospital Complex (IKHC) twice and one week apart and so the reliability was confirmed.

Using web-based applications including WhatsApp, Telegram, Instagram and Facebook, the link to the questionnaire was sent and exposed to the eligible ones from February 20, 2020 to April 8, 2020. The target population of the study was HCWs who were diagnosed as approved cases of COVID-19. In order to maintain the privacy of the participants, no personal identification data were collected and researchers were blinded to their IP addresses.

These HCWs categorized as physicians (also including residents or post-graduate trainees and interns or final year of the undergraduate trainees of medicine), nurses/nurse assistants, pharmacists, radiology technicians, laboratory technicians, and miscellaneous group. Due to the fact that physicians encounter COVID-19 patients in their respective medical wards, ICUs or EDs, other non-physician groups were asked about the places or wards of possible exposure to COVID-19 patients. After the official announcement of the coronavirus epidemic in Iran on Feburary-19, 2020, the participants of the present study were asked about the time interval between the official announcement of the epidemic in the country (February-20, 2020 as the day 0) and the onset of symptoms. The study participants were also asked about the most common clinical symptoms of COVID-19, and their type of used personal protective equipment (PPE) in details.

Despite the WHO's definition of suspected, possible or approved COVID-19 cases [4], from the beginning of the official announcement of the epidemic in Iran, along with acute clinical respiratory symptoms, imaging-based diagnoses were made using simple chest x-rays or Computed tomography (CT) scans, to take therapeutic measures and there were limited cases whose diagnosis was confirmed via reverse transcription polymerase chain reaction (RT-PCR).

Data on the location of encountering suspected, possible or approved cases of COVID-19 are categorized as outpatient clinics for patients with acute respiratory syndrome, emergency departments (EDs), admission wards or intensive care units (ICUs) of COVID-19 patients. The data of other HCWs encountering patients in places other than those mentioned above were collected in the miscellaneous group. Since HCWs can be potential sources of disease transmission, especially to family members and their roommates, data on the prevalence of the disease among people who have lived with these employees in the same household have been collected. All data presented by frequency and percent using charts.

Results

From March 29, 2020 to April 5, 2020 when the questionnaire was exposed to the target groups, a total of 452 participants had completed the online questionnaire. Table 1 reports the baseline characteristics of the study participants. Out of the total number of volunteers participating in the study, 230 (50.9%) were women and 222 (49.1%) were men. Diagnosis was based on CT scan in 295 cases (65.3%), based on simple chest x-ray in 129 cases (28.5%), and definitive diagnosis was made based on the result of RT-PCR in 126 cases (27.9%). The age group with the highest frequency of participants was between 25 and 29 years old

Table 1: The baseline characteristics of the participants

Variable	Number (%)
Sex	
Male	222 (49.1)
Female	230 (50.9)
Age	
20-24	9 (2.0)
25-29	91 (20.1)
30-34	61 (13.5)
35-39	68 (15.1)
40-44	76 (16.8)
45-49	50 (11.1)
50-54	74 (16.4)
55-59	14 (3.1)
≥ 60	9 (2.0)
Profession	
Physicians	312 (69.0)
• General practitioner	129 (41.3)
• Emergency medicine specialist	43 (13.8)
• Anesthesiologist	18 (5.8)
• Internal medicine specialist	18 (5.8)
• Infectious disease specialist	8 (2.6)
• Pathologist	5 (1.6)
• Pulmonologist	1 (0.3)
• Intensivists	1 (0.3)
• Miscellaneous	89 (28.5)
Nurses/Nurse assistants	79 (17.5)
Pharmacists	13 (2.9)
Laboratory technicians	9 (2.0)
Radiology technicians	9 (2.0)
Miscellaneous	30 (6.6)

(20%), followed by 40 to 44 years old (16.8%). Among the HCWs responding to the questionnaire, physicians, had the largest population with 312 people (69.0%), followed by nurses/nurse assistants with 78 people (17.5%). Among the physicians participating in the study, the highest number belongs to general practitioners with 129 cases (40.1%). Among the specialist groups, emergency medicine specialists had the highest rate of participation with 13.4%, followed by anesthesiologists and internal medicine specialists.

Figure 1 shows the frequency of non-physician HCWs who contracted COVID-19 from visiting patients based on their place of service. The place most frequently reported by these participants was ED with 58 cases (33.9%), followed by COVID-19 designated ward with 27 cases (15.8%).

Figure 2 shows the date of symptoms onset reported by the participants. The highest frequency with 85 cases (18.8%) was reported within the first 4 days (20-24th February, 2020).

Figure 3 shows the frequency of clinical symptoms among the study participants. The most frequent clinical symptoms were Fatigue in 315 cases (69.7%), fever in 275 cases (60.8%), body aches (muscle and skeletal) in 267 cases (59.1%) and dry cough in 230 cases (50.9%). Other clinical complaints include anorexia, sore throat, shortness of breath, loss of taste and smell, and sputum, respectively. Only one (0.2%) of the participants had no clinical symptoms.

Figure 4 shows the used PPE by the study participants. The most commonly used piece of equipment was gloves, which was used in 57.3% of the cases, followed by simple surgical mask, which was used by 47.1% of the participants. In 99 cases (21.9%) no PPE was used.

The treatment setting of participants was studied

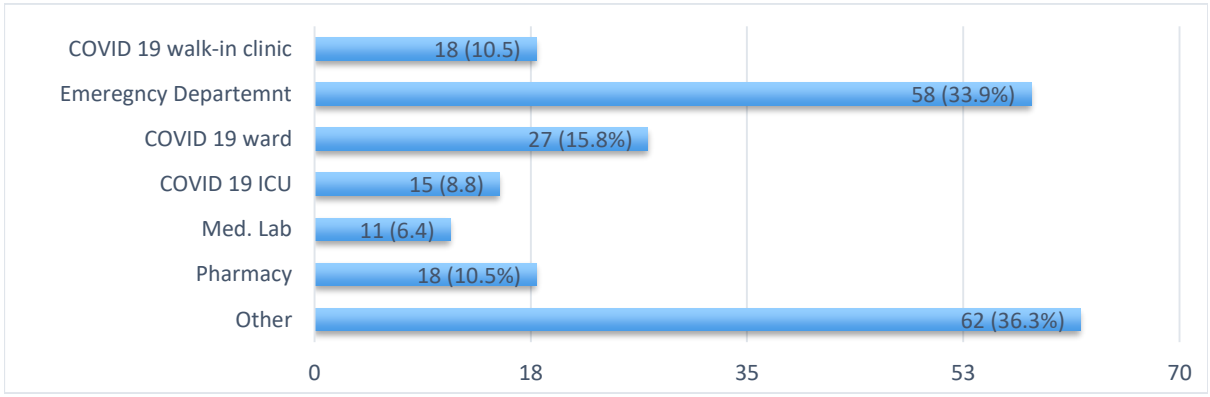

Figure 1: The frequency of non-physician HCWs who contracted COVID-19 from visiting patients based on their place of service

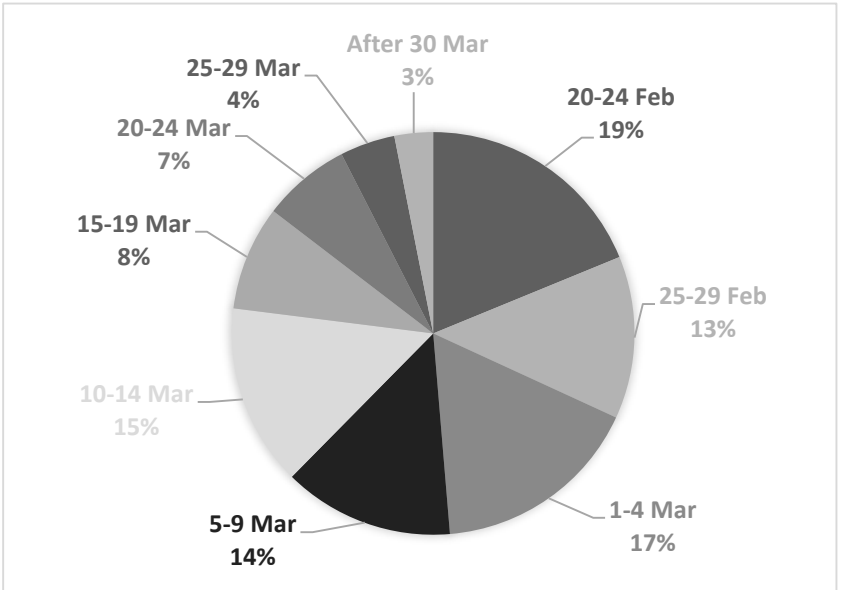

Figure 2: The date of symptoms onset reported by the participants

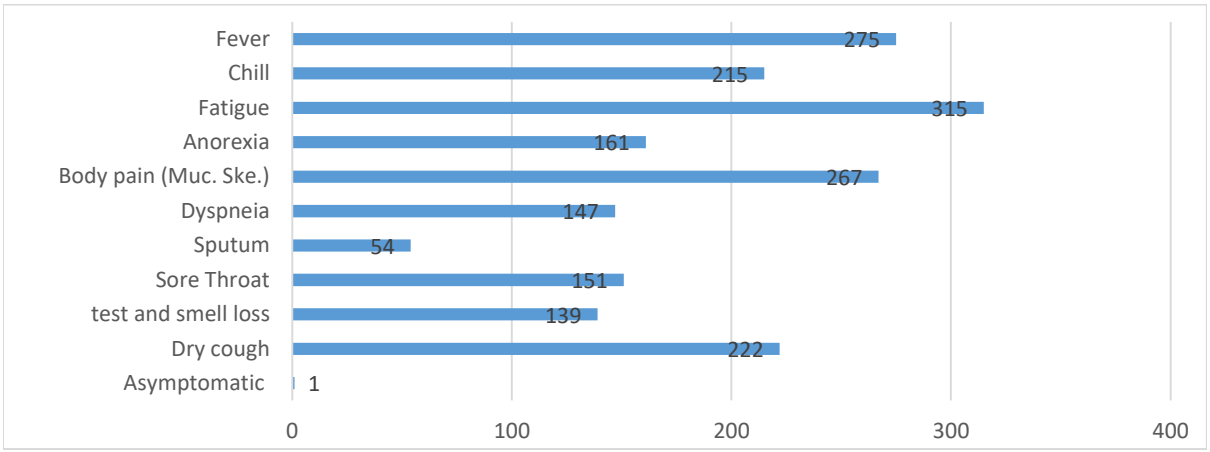

Figure 3: The frequency of clinical symptoms among the study participants

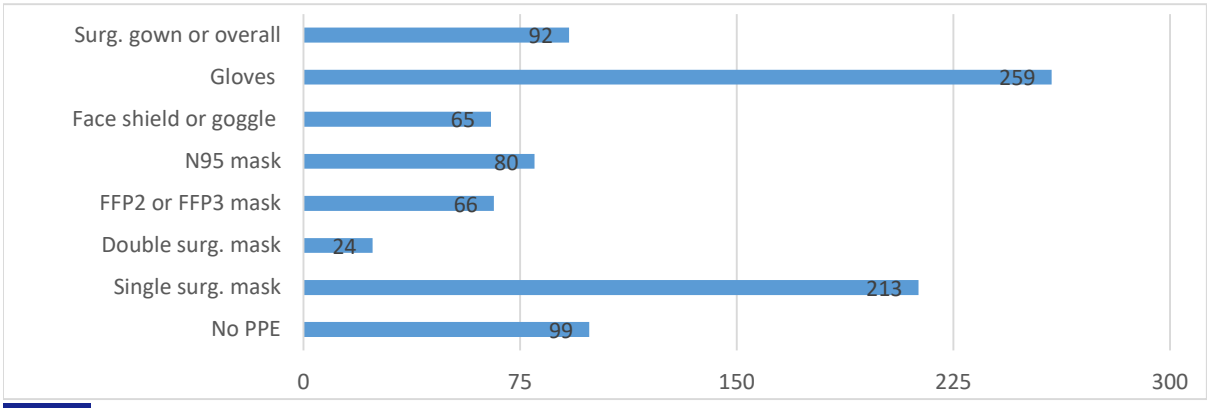

Figure 4: The frequency of use of different pieces of personal protective equipment among the study participants

and based on the results, 348 cases (91.6%) were treated in an outpatient setting and only 36 cases (9.5%) needed to be hospitalized and treated in a non-ICU ward and five cases (1.3%) needed to be admitted in the intensive care unit. The participants were also asked whether or not at least one person was subsequently infected with COVID-19 in their home, and it was founded that in 160 cases (35.4%), at least one person was infected in their household.

Discussion

According to the results of the present study, although the clinical manifestations of the disease among HCWs are very similar to the general population, less common symptoms such as fatigue and sore throat are seen in these people. In most of the participants of this study, diagnosis and initiation of treatment were based on clinical symptoms and diagnosis was confirmed via imaging results, but no definitive laboratory diagnostic test has been used. This might have led to a lower documented prevalence data among the studied HCWs compared to the actual rate. On the other hand, suspected cases with uncertain diagnosis also get the treatment and job leave. The importance of HCW's contamination with the virus, especially when they are asymptomatic, is crucial. This risk is not negligible. Less symptomatic or asymptomatic ones could transmit the disease to other staff or patients or transmit the disease to their own family members. Designing national protocols for RT-PCR testing with the aim of screening and confirming the diagnosis in all suspected HCWs caring for COVID-19 emergency rooms, wards or ICUs, is seems necessary during the epidemic. Given that HCWs, especially physicians and nurses, are in the moderate to high-risk groups for SARS-CoV-2 contamination, their PPE need to be upgraded and supervised based on global protocols. Finally, although the treatment of most of these HCWs as patients had taken place in an outpatient setting, the risk of transmitting the disease to family members is a potential risk that should be considered and weighed.

According to the conducted survey, our suggestions are:

- Designing a study with the aim of screening all

medical personnel to find the true prevalence of COVID-19 among all categories of exposures.
- Designing a questionnaire with additional information and conducting a similar study on a national scale among all categories of medical staff.
- Designing and conducting a study to compare the prevalence of COVID-19 in different centers with different personal protective equipment protocols.
- Designing and conducting a study to compare the cost of providing standard personal protective equipment or increasing supervision on their adherence to the standard protocols compared to the cost of treatment and job leaves after contamination with COVID-19 on duty.

Limitations

This study has been conducted using a number of personal social networking softwares and people included in in study have filled out the online questionnaire voluntarily. There is a strong possibility that many medical staff had not participated and therefore, weren't reported in this study, especially those who are still in the treatment process. Also, those who were in a severe or critical condition could be unable to participate in this study. In our study, it was not possible to collect information from patients with critical conditions and those hospitalized in ICUs or cases that had passed away.

CONCLUSIONS

Considerable number of participants that declared their infection in this study, emphasizes on the considerable rate of Iranian HCWs infected by COVID-19.

ACKNOWLEDGEMENTS

None.

AUTHORS' CONTRIBUTION

All the authors met the standards of authorship based on the recommendations of the International Committee of Medical Journal Editors.

CONFLICT OF INTEREST

None declared.

FUNDING

None declared.

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